

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. - 6. cancel

7. (new): An automatic programming device that creates a machining program for machining a machining area determined by using a work model and a product model with a numerical control device for a two-spindle machine having a first main spindle and a sub-spindle and a one-spindle machine having a second main spindle, the automatic programming device comprising:

a first machining-program creating unit that creates a machining program for the two-spindle machine, including a first machining program for a first process that is performed by using the first main spindle and a second machining program for a second process that is performed by using the sub-spindle;

a second machining-program creating unit that creates a machining program for the one-spindle machine, including a third machining program for a third process and a fourth machining program for a fourth process that are performed by using the second main spindle; and

a selecting unit that determines a type of a machine to use, and selects either one of the first machining-program creating unit and the second machining-program creating unit to start, based on the determined type of the machine, wherein

the first machining-program creating unit executes a first process development processing for dividing a first machining for the first process and a second machining for the second process into a unit of machining in which a continuous machining is performed with same spindle and

same tool, collectively for the first machining and the second machining, and

the second machining-program creating unit executes a second process development processing for dividing a third machining for the third process and a fourth machining for the fourth process into the unit of machining, separately for the third machining and the fourth machining.

8. (new): The automatic programming device according to claim 7, wherein

the first machining-program creating unit includes

a product-model setting unit that selectively sets the product model;

a work-model setting unit that selectively sets the work model;

a jig setting unit that sets a jig for each of the first process and the second process;

a registration setting unit that executes a registration process between the product model and the work model in each of the first process and the second process;

a process-division setting unit that sets a process dividing position between the first process and the second process;

a process-development processing unit that divides the first machining and the second machining into the unit of machining; and

a program-development processing unit that creates the first machining program and the second machining program based on information on process-developed machining units, information on a tool, and cutting conditions.

9. (new): The automatic programming device according to claim 7, wherein

the second machining-program creating unit includes

a product-model setting unit that selectively sets the product model;

a work-model setting unit that selectively sets the work model;

a jig setting unit that sets a jig for each of the third process and the fourth process;

a registration setting unit that executes a registration process between the product model and the work model in each of the third process and the fourth process;

a process-division setting unit that sets a process dividing position between the third process and the fourth process;

a work-model reversing unit that reverses a direction of the work model by 180 degrees;

a process-development processing unit that divides the third machining and the fourth machining into the unit of machining; and

a program-development processing unit that creates the third machining program and the fourth machining program based on information on process-developed machining units, information on a tool, and cutting conditions.

10. (new): An automatic programming method for creating a machining program for machining a machining area determined by using a work model and a product model with a numerical control device for a two-spindle machine having a first main spindle and a sub-spindle and a one-spindle machine having a second main spindle, the automatic programming method comprising:

selecting a type of a machine to use;

creating, when the type of the machine is the two-spindle machine, a machining program including

- selectively setting the product model;
- selectively setting the work model;
- setting a jig for a first process that is performed by using the first main spindle;
- executing a registration process between the product model and the work model in the first process;
- setting a process dividing position between the first process and a second process that is performed by using the sub spindle;
- setting a jig for the second process;
- executing a registration process between the product model and the work model in the second process;
- dividing a first machining for the first process and a second machining for the second process into the unit of machining; and
- creating a first machining program for the first process and a second machining program for the second process based on information on process-developed machining units, information on a tool, and cutting conditions,

creating, when the type of the machine is the one-spindle machine, a machining program including

- selectively setting the product model;

selectively setting the work model;

setting a jig for a third process in which a machining is performed by holding one end of the work model with the second main spindle;

executing a registration process between the product model and the work model in the third process;

setting a process dividing position between the third process and a fourth process in which a machining is performed by holding other end of the work model with the second main spindle;

dividing a machining for the third process into a unit of machining;

creating a third machining program for the third process based on information on process-developed machining units of the third process, information on a tool for the third process , and cutting conditions for the third process;

reversing the work model so that the work model is held by the second main spindle;

setting a jig for the fourth process;

executing a registration process between the product model and the work model in the fourth process;

dividing a machining for the fourth process into a unit of machining; and

creating a fourth machining program for the fourth process based on information on process-developed machining units of the fourth process, information on a tool for the fourth process , and cutting conditions for the fourth process.

11. (new): A computer-readable recording medium that stores a computer program for creating a machining program for machining a machining area determined by using a work model and a product model with a numerical control device for a two-spindle machine having a first main spindle and a sub-spindle and a one-spindle machine having a second main spindle, wherein the computer program causes a computer to execute:

selecting a type of a machine to use;

creating, when the type of the machine is the two-spindle machine, a machining program including

selectively setting the product model;

selectively setting the work model;

setting a jig for a first process that is performed by using the first main spindle;

executing a registration process between the product model and the work model in the first process;

setting a process dividing position between the first process and a second process that is performed by using the sub spindle;

setting a jig for the second process;

executing a registration process between the product model and the work model in the second process;

dividing a first machining for the first process and a second machining for the second process into the unit of machining; and

creating a first machining program for the first process and a second machining

program for the second process based on information on process-developed machining units,
information on a tool, and cutting conditions,

creating, when the type of the machine is the one-spindle machine, a machining program
including

selectively setting the product model;

selectively setting the work model;

setting a jig for a third process in which a machining is performed by holding one
end of the work model with the second main spindle;

executing a registration process between the product model and the work model in
the third process;

setting a process dividing position between the third process and a fourth process
in which a machining is performed by holding other end of the work model with the second main
spindle;

dividing a machining for the third process into a unit of machining;

creating a third machining program for the third process based on information on
process-developed machining units of the third process, information on a tool for the third
process, and cutting conditions for the third process;

reversing the work model so that the work model is held by the second main
spindle;

setting a jig for the fourth process;

executing a registration process between the product model and the work model in

the fourth process;

dividing a machining for the fourth process into a unit of machining; and

creating a fourth machining program for the fourth process based on information on process-developed machining units of the fourth process, information on a tool for the fourth process, and cutting conditions for the fourth process.